IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently amended) A method, comprising;

modulating a ~~carrier~~ signal in a first domain selected from the group consisting of phase, frequency, amplitude, polarization, and spread;

modulating the ~~carrier~~ signal in a second domain selected from the group consisting of phase, frequency, amplitude, polarization, and spread; ~~and~~

modulating the ~~carrier~~ signal in a third domain selected from the group consisting of phase, frequency, amplitude, polarization, and spread; and

transmitting the modulated signal,

wherein modulating the signal in the first domain, modulating the signal in the second domain and modulating the signal in the third domain defines a three dimensional orthogonal symbol constellation selected from the group consisting of face-centered cubic spheres and hexagonal close-packed spheres, each sphere having 12 nearest neighbors, and

wherein the three dimensional orthogonal symbol constellation includes an origin at {0,0,0} containing a center sphere characterized by zero power transmitted.

2. (Canceled)

3. (Currently amended) The method of claim 1, wherein modulating the ~~carrier~~ signal in the first domain includes phase modulation, modulating the ~~carrier~~ signal in the second domain includes amplitude modulation and modulating the ~~carrier~~ signal in the third domain includes spread modulation.

4. (Canceled)

5. (Currently amended) A method, comprising;

modulating a signal in a first domain selected from the group consisting of phase, frequency, amplitude, polarization, and spread;

modulating the signal in a second domain selected from the group consisting of phase, frequency, amplitude, polarization, and spread;

modulating the signal in a third domain selected from the group consisting of phase, frequency, amplitude, polarization, and spread;

modulating the signal in a fourth domain selected from the group consisting of phase, frequency, amplitude, polarization, and spread; and

transmitting the modulated signal, ~~The method of claim 4,~~

wherein modulating the ~~carrier~~ signal in the first domain, modulating the ~~carrier~~ signal in the second domain, modulating the ~~carrier~~ signal in the third domain, and modulating the ~~carrier~~ signal in the fourth domain defines a four-dimensional orthogonal symbol constellation of face-centered cubic hyperspheres, each hypersphere having 24 nearest neighbors, and

wherein the four-dimensional orthogonal symbol constellation includes an origin containing a center sphere characterized by zero power transmitted.

6. (Canceled)

7. (Currently amended) A method, comprising:

modulating a signal in a first domain selected from the group consisting of phase, frequency, amplitude, polarization, and spread;

modulating the signal in a second domain selected from the group consisting of phase, frequency, amplitude, polarization, and spread;

modulating the signal in a third domain selected from the group consisting of phase, frequency, amplitude, polarization, and spread;

modulating the signal in a fourth domain selected from the group consisting of phase, frequency, amplitude, polarization, and spread;

modulating the signal in a fifth domain selected from the group consisting of phase, frequency, amplitude, polarization and spread; and

transmitting the modulated signal, ~~The method of claim 6,~~

wherein modulating the ~~carrier~~ signal in the first domain, modulating the ~~carrier~~ signal in the second domain, modulating the ~~carrier~~ signal in the third domain, modulating the ~~carrier~~ signal in the fourth domain and modulating the ~~carrier~~ signal in the fifth domain defines a five-dimensional orthogonal symbol constellation of hyperspheres, each hypersphere having 48 nearest neighbors, and

wherein the five-dimensional orthogonal symbol constellation includes an origin containing a center sphere characterized by zero power transmitted.

8-9. (Canceled)

10. (Currently amended) The method of claim 1, wherein modulating the ~~carrier~~ signal in the third domain includes a constant envelope technique.

11. (Currently amended) A method, comprising;

receiving a signal;

demodulating ~~a~~ the signal in a first domain selected from the group consisting of phase, frequency, amplitude, polarization and spread;

demodulating the signal in a second domain selected from the group consisting of phase, frequency, amplitude, polarization and spread; and

demodulating the signal in a third domain selected from the group consisting of phase, frequency, amplitude, polarization and spread,

wherein demodulating the signal in the first domain, demodulating the signal in the second domain and demodulating the signal in the third domain decodes a three dimensional orthogonal symbol constellation selected from the group consisting of face-centered cubic spheres and hexagonal close-packed spheres, each sphere having 12 nearest neighbors, and

wherein the three dimensional orthogonal symbol constellation includes an origin at {0,0,0} containing a center sphere used for counting purposes but not for energy determination.

12. (Canceled)

13. (Original) The method of claim 11, wherein demodulating the signal in the first domain includes phase demodulation, demodulating the signal in the second domain includes amplitude demodulation and demodulating the signal in the third domain includes spread demodulation.

14. (Canceled)

15. (Currently amended) A method, comprising:
receiving a signal;
demodulating the signal in a first domain selected from the group consisting of phase, frequency, amplitude, polarization and spread;
demodulating the signal in a second domain selected from the group consisting of phase, frequency, amplitude, polarization and spread;
demodulating the signal in a third domain selected from the group consisting of phase, frequency, amplitude, polarization and spread; and
demodulating the signal in a fourth domain selected from the group consisting of phase, frequency, amplitude, polarization and spread, ~~The method of claim 14,~~
wherein demodulating the signal in the first domain, demodulating the signal in the second domain, demodulating the signal in the third domain and demodulating the signal in the fourth domain decodes a four-dimensional orthogonal symbol constellation of face-centered cubic hyperspheres, each hypersphere having 24 nearest neighbors, and
wherein the four-dimensional orthogonal symbol constellation includes an origin containing a center sphere used for counting purposes but not for energy determination.

16. (Canceled)

17. (Currently amended) A method, comprising:
receiving a signal;
demodulating the signal in a first domain selected from the group consisting of phase, frequency, amplitude, polarization and spread;

demodulating the signal in a second domain selected from the group consisting of phase, frequency, amplitude, polarization and spread;

demodulating the signal in a third domain selected from the group consisting of phase, frequency, amplitude, polarization and spread;

demodulating the signal in a fourth domain selected from the group consisting of phase, frequency, amplitude, polarization and spread; and

demodulating the signal in a fifth domain selected from the group consisting of phase, frequency, amplitude, polarization and spread, ~~The method of claim 16,~~

wherein demodulating the signal in the first domain, demodulating the signal in the second domain, demodulating the signal in the third domain, demodulating the signal in the fourth domain and demodulating the signal in the fifth domain decodes a five-dimensional orthogonal symbol constellation of hyperspheres, each hypersphere having 48 nearest neighbors, and

wherein the five-dimensional orthogonal symbol constellation includes an origin containing a center sphere used for counting purposes but not for energy determination.

18-19. (Canceled)

20. (Original) The method of claim 11, wherein demodulating the signal in the third domain includes a constant envelope technique.

21. (New) The method of claim 1, wherein each state of the three dimensional orthogonal symbol constellation is assigned to a particular, distinct direct-sequence spreading code.

22. (New) The method of claim 5, wherein each state of the four-dimensional orthogonal symbol constellation is assigned to a particular, distinct direct-sequence spreading code.

23. (New) The method of claim 7, wherein each state of the five-dimensional orthogonal symbol constellation is assigned to a particular, distinct direct-sequence spreading code.

24. (New) The method of claim 1, wherein the three dimensional orthogonal symbol constellation provides a maximum symbol-to-error ratio for a given average signal power.

25. (New) The method of claim 5, wherein the four-dimensional orthogonal symbol constellation provides a maximum symbol-to-error ratio for a given average signal power.

26. (New) The method of claim 7, wherein the five-dimensional orthogonal symbol constellation provides a maximum symbol-to-error ratio for a given average signal power.

27. (New) The method of claim 1, wherein the three dimensional orthogonal symbol constellation has a packing fraction of approximately 0.7405.

28. (New) The method of claim 5, wherein the four-dimensional orthogonal symbol constellation has a packing fraction of $\pi^2/_{16}$.

29. (New) The method of claim 7, wherein wherein the five-dimensional orthogonal symbol constellation has a packing fraction of $\pi^2/_{15\sqrt{2}}$.

30. (New) The method of claim 11, wherein each state of the three dimensional orthogonal symbol constellation decodes to a particular, distinct direct-sequence spreading code.

31. (New) The method of claim 15, wherein each state of the four-dimensional orthogonal symbol constellation decodes to a particular, distinct direct-sequence spreading code.

32. (New) The method of claim 17, wherein each state of the five-dimensional orthogonal symbol constellation decodes to a particular, distinct direct-sequence spreading code.

33. (New) The method of claim 11, wherein the three dimensional orthogonal symbol constellation decodes to provide a maximum symbol-to-error ratio for a given average signal power.

34. (New) The method of claim 15, wherein the four-dimensional orthogonal symbol constellation decodes to provide a maximum symbol-to-error ratio for a given average signal power.

35. (New) The method of claim 17, wherein the five-dimensional orthogonal symbol constellation decodes to provide a maximum symbol-to-error ratio for a given average signal power.

36. (New) The method of claim 11, wherein the three dimensional orthogonal symbol constellation has a packing fraction of approximately 0.7405.

37. (New) The method of claim 15, wherein the four-dimensional orthogonal symbol constellation has a packing fraction of $\pi^2/_{16}$.

38. (New) The method of claim 17, wherein the five-dimensional orthogonal symbol constellation has a packing fraction of $\pi^2/_{15\sqrt{2}}$.

39. (New) The method of claim 5, wherein modulating the signal in the third domain includes a constant envelope technique.

40. (New) The method of claim 7, wherein modulating the signal in the third domain includes a constant envelope technique.

41. (New) The method of claim 15, wherein demodulating the signal in the third domain includes a constant envelope technique.

42. (New) The method of claim 17, wherein demodulating the signal in the third domain includes a constant envelope technique.

43. (New) The method of claim 5, wherein the four-dimensional orthogonal modulating symbol constellation includes mapping the four rectangular coordinates to four quadrature amplitudes, one pair on each of two orthogonal antennas, according to the equations:
$s_0 = a^2 = b^2$; $s_1 = s_0 \sin\psi \sin\phi \cos\theta$, $s_2 = s_0 \sin\psi \sin\phi \sin\theta$, $s_3 = s_0\, s_0 \sin\psi \cos\phi$; and
$s_4 = s_0 \cos\psi$, where $\{\psi, \phi, \theta\}$ are hyperspherical angles in accord with Poincaré spherical angles θ and ϕ in three dimensions.

44. (New) The method of claim 15, wherein the four-dimensional orthogonal demodulating symbol constellation includes mapping the four rectangular coordinates to four quadrature amplitudes, one pair on each of two orthogonal antennas, according to the equations:
$s_0 = a^2 = b^2$; $s_1 = s_0 \sin\psi \sin\phi \cos\theta$, $s_2 = s_0 \sin\psi \sin\phi \sin\theta$, $s_3 = s_0\, s_0 \sin\psi \cos\phi$; and
$s_4 = s_0 \cos\psi$, where $\{\psi, \phi, \theta\}$ are hyperspherical angles in accord with Poincaré spherical angles θ and ϕ in three dimensions.